

AMENDMENTS

In the Claims

The following is a marked-up version of the claims with the language that is underlined (“ ”) being added and the language that contains strikethrough (“”) being deleted:

1. (Canceled)

2. (Previously Presented) the method of Claim 4, wherein said modulating the dot density modulates the spacing of the dot to be printed for said pixel location with respect to preceding and subsequent pixel locations and said modulating the dot size modulates the size of said dot to be printed for said pixel location.

3. (Canceled)

4. (Previously Presented) A method of halftoning an image, said method comprising:

inputting an input pixel value for a pixel location within said image;

modulating the dot density of said image; and

modulating the dot size of printed dots to obtain a printed halftone image;

wherein modulating the dot density of said image comprises controlling the dot density for said pixel location within said image using said input pixel value and performing dispersed dot halftoning to produce a dot position based on said dot density;

wherein said modulating the dot size of said image comprises controlling the dot size for said pixel location within an image using said input pixel value and performing dot size modulation based on said dot size and said dot position.

5. (Original) The method of Claim 4, wherein controlling the dot density for said pixel location comprises generating a dot density value based on said input pixel value, said dot density value being used to perform said dispersed dot halftoning, and wherein said controlling the dot size for said pixel location comprises generating a dot size value based on said input pixel value, said dot size value being used to perform dot size modulation.

6. (Original) The method of Claim 5, wherein said generating a dot density value is performed using a first look up table and generating a dot size value is performed using a second look up table.

7. (Original) The method of Claim 4, wherein controlling the dot density for said pixel location and performing dispersed dot halftoning are performed in a first integrated process and controlling the dot size for said pixel location and performing dot size modulation are also performed in a second integrated process.

8. (Original) The method of Claim 4, wherein said modulating the dot size of said image further comprises diffusing at least a portion of the dot size for the pixel location to at least one subsequently processed pixel location.

9. (Previously Presented) The method of Claim 4, wherein said modulating the dot density is performed using at least one of error diffusion, dispersed dot screening, and iterative search based halftoning.

10. (Previously Presented) The method of Claim 9, wherein said modulating the dot density is performed using tone dependent error diffusion.

11. (Original) The method of Claim 10, further comprising:
- generating a dot density value based on said input pixel value, said dot density value being used in said tone dependent error diffusion;
- said tone dependent error diffusion, comprising:
- combining said dot density value with at least one previous error value to produce a modified pixel value;
- comparing said modified pixel value with a threshold value to produce a halftone value for said pixel location; and
- using said halftone value for said pixel location to produce an error value that is diffused to at least one subsequently processed pixel.
12. (Previously Presented) The method of Claim 4, wherein said modulating the dot size is performed using pulse width modulation.
13. (Original) The method of Claim 12, wherein said pulse width modulation provides a first value indicating the width of the pulse and a second value indicating the justification of said pulse within a pixel location.
14. (Original) The method of Claim 13, wherein when a printed dot is larger than one pixel, the pulse within adjacent pixels are justified together so that the dot may be formed with one continuous pulse.
15. (Canceled)

16. (Previously Presented) The method of Claim 4, wherein performing dispersed dot halftoning comprises using accumulated errors diffused from at least one other pixel location and providing an error for said pixel location to be diffused to at least one subsequently processed pixel location.

17. – 19. (Canceled)

20. (Previously Presented) The method of Claim 12, wherein said pulse width modulation is performed using a look-up table.

21. (Previously Presented) The method of Claim 4, further comprising diffusing at least a portion of said dot size value for the pixel location to at least one subsequently processed pixel location.

22. (Original) A method of optimizing a dot size look-up table and a dot density look-up table for a printing system that uses dot size modulation and dot density modulation, the method comprising:

printing at least one test page showing the combinations of dot sizes and dot densities;

measuring the output absorptance for each combination and the print distortion for each combination;

determining the print distortion at each output absorptance using the measured output absorptance and the measured print distortion for each combination;

calculating the optimized dot size look-up table using the print distortion at each output absorptance; and

calculating the optimized dot density look-up table using the print distortion at each output absorptance.

23. (Original) The method of Claim 22, wherein determining the print distortion comprises:

inverting the output absorptance for each combination to compute the value of the dot density required to produce each output absorptance; and
using the inverted output absorptance and the print distortion for each combination to determine the print distortion as a function of output absorptance.

24. (Original) The method of Claim 22, wherein calculating the optimized dot size look-up table comprises minimizing a cost function of the print distortion at each output absorptance as a function of dot size.

25. (Original) The method of Claim 24, wherein calculating the optimized dot density look-up table further comprises using the calculated optimized dot size look-up table.

26. – 38. (Canceled)

39. (New) An image forming system for halftoning an image, said system comprising:
an image forming device operative to:

receive an input pixel value for a pixel location within the image;
modulate the dot density of the image by controlling the dot density for the pixel location within the image using the input pixel value and performing dispersed dot halftoning to produce a dot position based on the dot density; and

modulate the dot size of printed dots to obtain a printed halftone image by controlling the dot size for the pixel location within an image using the input pixel value and performing dot size modulation based on the dot size and the dot position.

40. (New) The image forming system of Claim 39, wherein the image forming device is one of an electrophotographic printing device, electrophotographic copying device, and an inkjet printer.
41. (New) The image forming system of Claim 40, wherein the image forming device is operative to modulate the dot size using pulse width modulation.
42. (New) The image forming system of Claim 41, wherein the image forming device comprises a look-up table, and the pulse width modulation is performed using the look-up table.